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Substitute Abstract

A surface processing method of a sample having a mask layer that does not contain carbon as a major component formed on a substance to be processed, the substance being a metal, semiconductor and insulator deposited on a silicon substrate, includes the steps of installing the sample on a sample board in a vacuum container, generating a plasma that consists of a mixture of halogen gas and adhesive gas inside the vacuum container, applying a radio frequency bias voltage having a frequency ranging from 200 kHz to 20 MHz on the sample board, and controlling a periodic on-off of the radio frequency bias voltage with an on-off control frequency ranging from 100 Hz to 10 kHz.